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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/813,890

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EXAMINER

LAZORCIK, JASON L

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

11/23/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/813,890

Applicant(s)

YABUKI ET AL.

Examiner

Jason L. Lazorcik

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-10, 12-16 and 20-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-10, 12-16 and 20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/4/2007.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

The request for a continued prosecution application (CPA) under 37 CFR 1.53(d) filed on October 4, 2007 is acknowledged. 37 CFR 1.53(d)(1) was amended to provide that the CPA must be for a design patent and the prior application of the CPA must be a design application that is complete as defined by 37 CFR 1.51(b). See *Elimination of Continued Prosecution Application Practice as to Utility and Plant Patent Applications*, final rule, 68 *Fed. Reg.* 32376 (May 30, 2003), 1271 *Off. Gaz. Pat. Office* 143 (June 24, 2003). Since a CPA of this application is not permitted under 37 CFR 1.53(d)(1), the improper request for a CPA is being treated as a request for continued examination of this application under 37 CFR 1.114.

Allowable Subject Matter

The indicated allowability of claims 20-23 is withdrawn in view of the newly discovered reference(s) to Holzer (DE 19855240). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

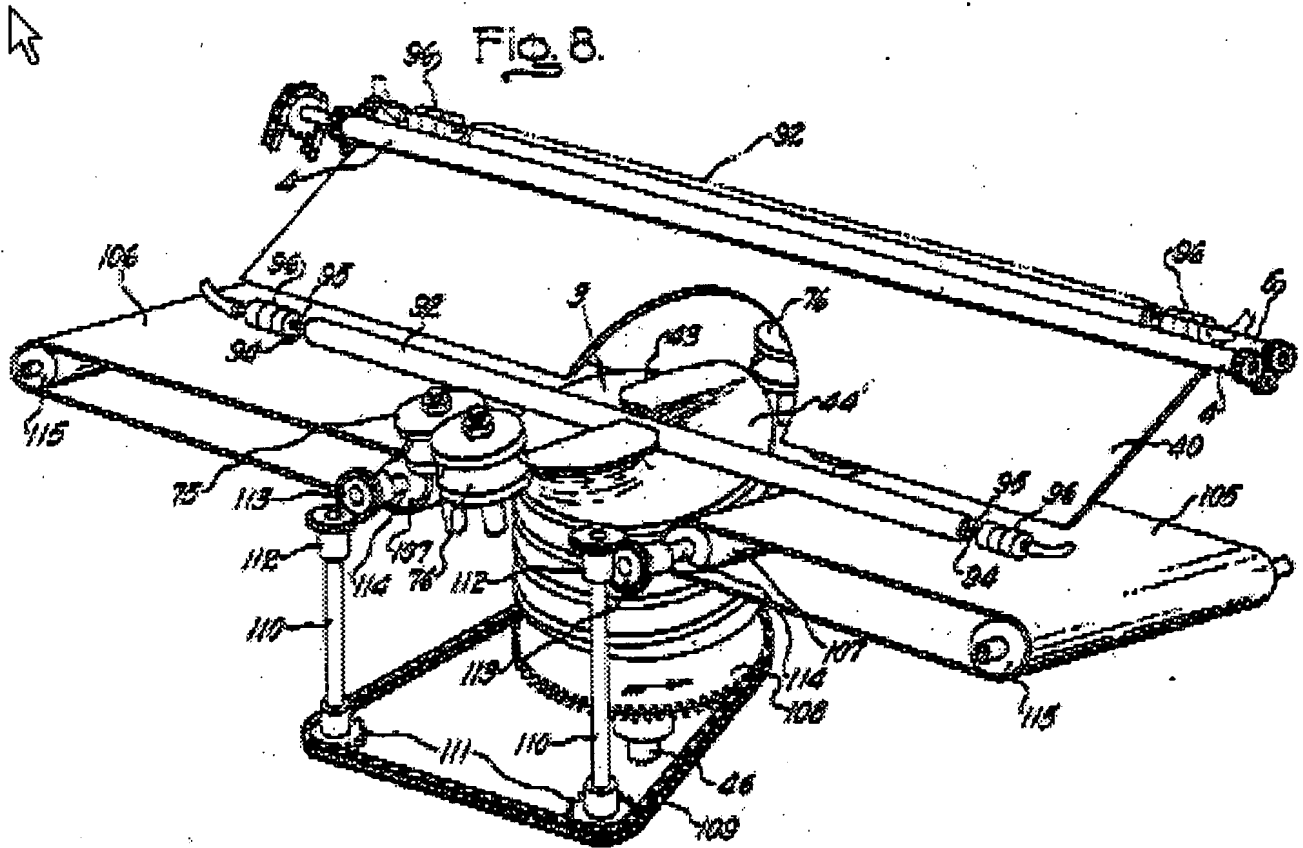
The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-10, 12-16, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greiner (US 2,491,857) in view of Holzer (DE 19855240).

In view of the figure 8 excerpt below, Greiner teaches (Column 1, Lines 1-30) a method of manufacturing a double spiral shaped body from a piece of elongated vitreous stock (92). The manufacturing method comprises heating a substantially straight section of glass tube to a softened state in a heating furnace. As indicated in the previous Office Action dated June 22, 2007, Greiner teaches lowering this heat softened tube along a substantially perpendicular pathway from a first position within the furnace to a second position located below the furnace and proximal to a mandrel (3).

The second position of the softened tube is characterized by a "hanging and holding" orientation wherein the ends of the tube are supported upon support belts (105,106) while a central portion of the softened stock, which is hangs between the support belts, is "held on a top of the mandrel" (3).



The instant reference figures 7 and 12 depict a winding step wherein the glass stock is wound about the mandrel to yield the double helix structure. As further evident in the instant figures, the mandrel provides "winding grooves" along the periphery thereof which correspond to the shape of the formed double spiral". The winding apparatus is further provided with "at least one pair of supporting rollers" (75, 76) which serves to support the softened stock during the winding process. Finally, the instant reference clearly provides for introduction of an internal gas atmosphere while said bend lamb tube is held upon the mandrel in order to maintain the desired tube shape (Column 10, lines 17-31).

Regarding Claims 2,3, and 9, Greiner fails to explicitly limit the temperature range of the elongated stock during the stock heating step as set forth by applicant in Claim 2. Similarly, Griener is silent regarding Applicants limitation wherein the thermal variance along the length of the stock should be limited to +/- 8 degrees centigrade of a target temperature as disclosed in Claim 3.

That said, Greiner makes very clear that the length of the vitreous body be heated to a workable state and that there should be a "even distribution of the heat over the entire periphery of the vitreous body (column 1, Lines 24-27). Greiner further indicates that during the heating stage, conditions should be controlled in such a manner as to heat the tubing to a workable condition although not so hot as to cause it to collapse. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to control both the temperature of the elongated stock within the working range (e.g. above softening point) as well as to maintain an even temperature distribution along the length of the elongated stock in such a manner that results in an optimal coiled product.

With respect to Claim 13, Greiner teaches that the guiding rollers (75 and 76) are provided "for directing pressing said vitreous body properly into the grooves of the (mandrel) without distortion" (column 1, Lines 40-42). It is further clear from the elevation figures 2, 7, and 8 that said rollers are inclined at an angle with respect to the horizontal plane defined by the upper surface of the belts (105,106). While the reference fails to provide a specific angle of inclination, absent any unexpected results to the contrary it would have been obvious to one of ordinary skill in the art at the time of

the invention to provide said rollers at any angle of inclination that provided the intended "proper" seating of the tubing within the mandrel grooves without deformation.

With respect to claims 10, 11, 14-15, and 17, it is noted that the Greiner reference fails explicitly provide a rate of winding higher than the rate at which the chucks advance toward the mandrel. Specifically, Greiner teaches that during the bending operation one should "avoid, as much as possible, all longitudinal lengthening and deformation of said vitreous body" (column 2, Lines 28-30). More specifically, the reference teaches that "the belts (105) and (106) are moved toward the form (3) during (the bending time interval) at a rate designed to advance the end portions of the lamp (92) toward the form (3) as rapidly as it is wound thereabout so as to reduce the separate longitudinal movement of said end portions to a minimum and thereby reduce the possibility of any elongation of the lamp (92)" (column 9, lines 61-68).

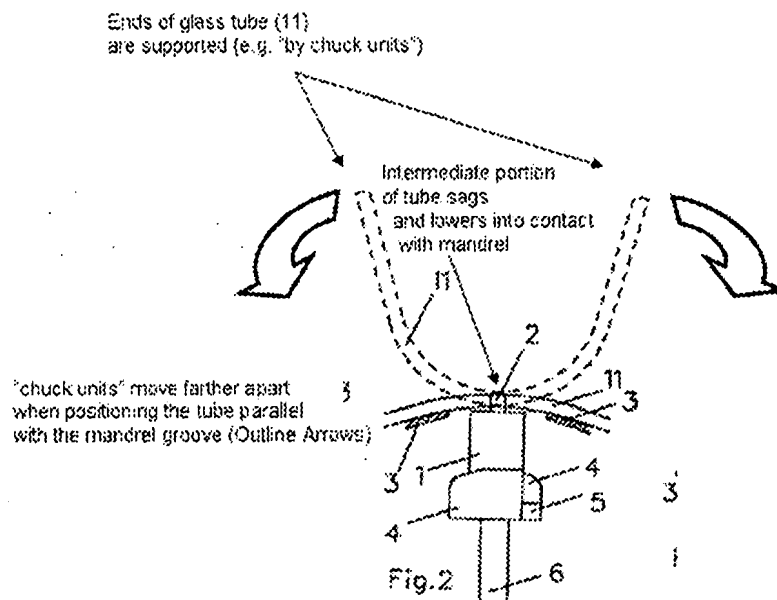
From the above disclosures, Greiner clearly appreciated the need to balance the lamp winding rate with the translational movement of the lamp end portions in order to avoid deformation of the softened glass body. Further, one of ordinary skill in the art would certainly be apprised of the fact that a compressive force along the axis of a softened vitreous body would tend to bulge or thicken at least a portion said body while a net tensile force would tend to elongate or thin at least a portion of the softened vitreous body. Therefore with respect to the instant apparatus, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the gear ratios between for example the apparatus gears 108, 111, 112, and 113 using the well-

established theories present in the gearing art (http://en.wikipedia.org/wiki/Gear_ratio). Tailoring these gearing ratios according to the indicated, well established principles would adjust the relative rates of rotation between the mandrel and the belts 105 and 106, consequently affecting the forces imparted upon the softened vitreous body in a deterministic manner. It would therefore have been obvious to one of ordinary skill in the art to optimize the gear ratios in the apparatus in order to optimize the forces imparted upon the vitreous body and thereby "minimize the deformation" of the vitreous body in accord with the teachings of Greiner.

The Greiner reference teaches that the heated glass tube is advanced from the furnace to the support rollers (105,106) and mandrel (3) along the incline (40). Under the disclosed Greiner process, the ends of the tube are not secured by "chuck units", and the length of the tube remains substantially straight during the heating process and transfer process.

As such, the Greiner reference is silent with respect to a step of securing the ends of the glass tube by chuck units or the step of positioning the glass tube over the mandrel via relative movement of the chuck units as required by Applicants independent claim 8. Similarly regarding independent claim 20, the Greiner reference is silent with respect to the claimed step of securing the ends of a glass tube while heating said tube to cause sagging of an intermediate portion thereof followed by a step of lowering the tube until the sagging central portion engages a mandrel.

The German patent to Holzer et. al. (DE 19855240) teaches essentially every element of Applicants claimed invention which is not explicitly disclosed by the Greiner reference. Like the Greiner reference, Holzer teaches a method of manufacturing a double spiral arc tube by winding a heat softened section of glass tubing about the periphery of a mandrel. Unlike the Greiner reference which teaches maintaining a stock glass tube in a substantially linear geometry through heating of said tube to a softened state and through the step of aligning said tube with the top of the mandrel, Holzer teaches a "hanging and holding" for the heat softened tube (see annotated figure 2 excerpt below)



It is evident from the excerpt figure that Holzer teaches a step of supporting a heat softened glass tube by the ends of said tube while permitting a central portion thereof to sag under force of gravity. Although the Holzer does not explicitly state that

the starting glass tube is straight prior to heat softening of the tube, such a straight starting stock is either implicit in the disclosure or alternatively would have been obvious to one of ordinary skill at the time of the invention. Now returning to the instant figure 2, the sagging portion of tubing is lowered into contact with an alignment groove on the surface of the mandrel (2). This lowering step is followed by a step of positioning the tube upon supports (3) by moving the ends of the tube "farther apart from each other, along a line that connects one of the (ends) with the other of the (ends) when viewed from a direction toward which an axis of the mandrel extends".

It is evident from the foregoing that Holzer discloses Applicants claimed method of lowering a heat softened and sagging glass tube into alignment with a mandrel followed by the winding of said tube into a double spiral arc geometry. Absent any evidence of substantially unexpected results, the use of an initially straight segment of glass tubing stock and the use of "chuck units" to the ends of the glass tube are deemed to be merely trivial extensions over the Holzer disclosure.

Further, it would have been an obvious alternative to one of ordinary skill in the art at the time of the invention to substitute the Holzer glass tube hanging-and-holding method for the inclined ramp method used in the Greiner reference when transferring a heated glass tube from a heating furnace to the winding mandrel. Specifically since heat softened glass rapidly cools (e.g. changes viscosity) when placed in contact with an apparatus surface, one of ordinary skill would recognize the advantage maintaining

the heated tube in a contact free state during the transfer process as disclosed in the Holzer teachings.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLL


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